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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,359	03/16/2001	Akihiro Goto	Q63491	7871

7590 09/12/2003

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EXAMINER

DONG, DALEI

ART UNIT PAPER NUMBER

2875

DATE MAILED: 09/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/787,359

Applicant(s)

GOTO ET AL.

Examiner

Dalei Dong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/787,359.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,858,479 to Saito.

Regarding to claims 1-12, Saito discloses “in surface treating method by electric discharge, an electrode is formed by compressing titanium (Ti). In an electric discharge using this electrode, Ti pyrochemically reacts with carbon generated from a working fluid which is thermally decomposed. Then, Ti becomes TiC (titanium carbide) (*metal carbide*), that is a material of very high hardness, and is deposited on a workpiece or a base metal to form a coating thereon. At this time, a metal like Co (cobalt) which can become a binder is added to Ti as a compressed electrode material” (column 1, lines 28-37).

Saito also discloses “surface treating method of the invention uses TiH.sub.2 (*metal hydride*) green compact electrode for electric discharge machining. The TiH.sub.2 green compact electrode is made by compressing powders of TiH.sub.2 having a predetermined grain size under a prescribed pressure. The green compact electrode is normally formed into a disc shape of a fixed diameter and thickness. Then, the disc

shaped green compact is joined to a leading end of a solid metal electrode such as a copper rod via a conductive adhesive. Thus, an electric discharge electrode of TiH.sub.2 is obtained. The TiH.sub.2 green compact electrode is used for surface treatment of a predetermined hard metal as a workpiece. In such treatment, an electric discharge is generated in a working fluid between the TiH.sub.2 green compact electrode and the hard metal under a fixed condition. The working fluid contains therein carbon or includes a polymeric material which is thermally decomposed to generate carbon. Specifically, the polymeric material is composed of a mineral oil and fat or a vegetable oil and fat. This processing corresponds to the primary processing of the conventional surface treating processing shown in step S1 of FIG. 1, though the processing conditions are different therefrom" (column 5, lines 12-33).

Saito further discloses "hydrogen begins to separate from TiH.sub.2 at a temperature of 300.degree. C. or more (*desorbing hydrogen in the metal hydride*). It is supposed that a surface of the workpiece at a discharge point is kept at its boiling point during the electric discharge, which usually continues for 0.1 microsecond to 1,000 microsecond. Then, TiH.sub.2 is completely decomposed" (column 5, lines 37-42).

Saito further yet discloses, "a surface of the workpiece is initially cleaned by the hydrogen at nascent state, then the TiH.sub.2 powders are deposited on such a clean workpiece metal surface. After a first cycle of processing, all the workpiece metal surface is coated with Ti or TiC. Here, TiC is made by chemical combination of Ti with carbon due to oil decomposition. Then, such a Ti or TiC surface defines a workpiece surface to be treated by the following electric discharge. This means that there are no

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particles covered by such Ti as contains  $\text{TiO}_2$ , contrary to the prior art. Therefore, deposited layers obtained by the following coating steps are joined to the first layer with very strong adhesion. From the above facts, the coating layer in the present embodiment shows extremely strong adhesion to the hard metal. An abrasion test proves that it shows excellent antiwearing effects which have not been obtained conventionally" (column 5, line 65 to column 6, line 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have compress mold the metal carbide and metal hydride of Saito to form an electrode for electric discharge surface treatment to provide a surface treating method by electric discharge machining that makes material powders deposited well on a work piece like a sintered hard meal with strong adhesion, that prevents short circuits during processing and processing efficiency and finally provides a fine and beautiful finished surface.

Regarding to claims 13-16, Saito disclosed the claimed invention except for the claimed specific mixing ratio of two different metal powders. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have adjust the mixing ratio of the two metal powders in accordance with the desired chemical characteristics of the electrode, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***Response to Arguments***

3. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of composition and method of manufacturing a electrode for surface discharge treatment.

U.S. Patent No. 3,711,397 to Martinsons.

U.S. Patent No. 4,042,484 to Thiele.

U.S. Patent No. 4,373,947 to Biittner.

U.S. Patent No. 6,086,684 to Saito.

U.S. Patent No. 6,303,076 to Yamamoto.

U.S. Patent No. 6,365,008 to Goto.

U.S. Patent No. 6,501,232 to Goto.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

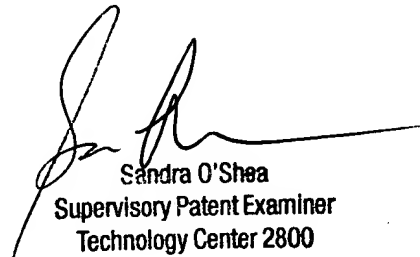
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.

August 27, 2003



Sandra O'Shea  
Supervisory Patent Examiner  
Technology Center 2800